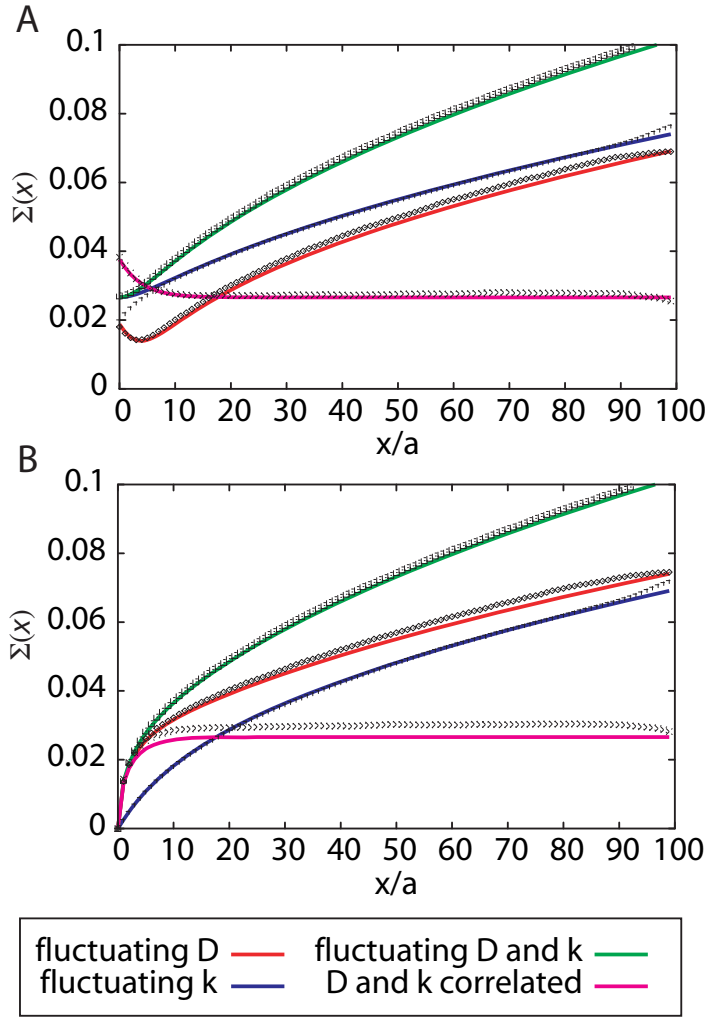

Fig. S1. Relative uncertainty Σ(*x*) of the steady state concentration *c(x)* for the diffusion-degradation model with disorder in one dimension (1). (**A**,**B**) The symbols indicate results from numerical calculations in which steady-state gradients were calculated for many (typically 100,000) realizations of the disorder. The lines show the corresponding analytical results (8) for Σ(*x*). The red lines show Σ(*x*) if only *D* is fluctuating, the blue lines if only *k* is fluctuating, the green lines if both *D* and *k* are fluctuating, and the magenta lines if *D* and *k* are fluctuating in a fully correlated way. In A, the current *j* is imposed at *x*=0. In B, the concentration *c* is imposed at *x*=0. Parameters are $\lambda / a = \sqrt{50}$, $\sigma_j / j_0 = \sigma_{c_0} / c_0 = 0$, $\sigma_D / D_0 = \sigma_k / k_0 = 0.1$. In the fully correlated case $2\rho_{kD} / k_0 D_0 = (\sigma_D / D_0)^2 + (\sigma_k / k_0)^2$ while ρ_{kD}=0 otherwise. A Gaussian distribution was used for the noise terms in the numerical calculations. Steady states were calculated on a linear chain of size 100*a*.